

17. Write the principles of Cloud chamber, nuclear emulsion, bubble chamber. Geiger-Muller and scintillation counter.
 18. Explain the principles and applications of Isotope dilution analysis.
 19. (a) Discuss the electronic configuration and common oxidation states of the lanthanides
(b) Describe the two different methods used for the synthesis of nanoparticles.
 20. Elaborate on the biological roles of sodium, potassium, calcium, zinc, and copper.
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NOVEMBER/DECEMBER 2025

**GCH22/DCH22 — INORGANIC
CHEMISTRY – II**

Time : Three hours

Maximum : 75 marks



SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Why Neutron diffraction is important?
2. Write the importance of solid state lasers?
3. Give example for nuclear isomerism with explanation.
4. Explain the term nuclear cross section.
5. What is carbon burning and list the primary elements synthesized during the process?
6. How does a synchrotron differ from a cyclotron, and what is its main advantage?
7. Briefly describe how the presence of unpaired f-electrons influences the magnetic characteristics of lanthanide ions.

8. Write the two techniques used for characterization in nanotechnology.
9. What is the primary function of a transport protein?
10. What is the role of Vitamin B₁₂ and which metal ion is present in its structure?

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Neatly draw the perovskite structure and explain with example.

Or

- (b) Discuss about solid state laser and inorganic phosphors.

12. (a) Note on merit and demerit of nuclear shell model.

Or

- (b) What is radioactive decay? Explain with example.

13. (a) Elaborate about linear accelerators.

Or

- (b) Discuss about radio immune assay.

14. (a) Describe the stereochemistry and coordination numbers typically exhibited by lanthanides.

Or

- (b) Discuss the use of nanomaterials in diagnostic biomedical applications.

- (a) Explain the cooperative binding of oxygen to hemoglobin and contrast it with the oxygen binding curve of myoglobin.

Or

- (b) Describe the biochemical function of carbonic anhydrase and explain its importance in maintaining pH balance in the blood.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Describe the working principle and applications of semiconductors. Differentiate between intrinsic and extrinsic semiconductors and explain the concept of p-type and n-type doping.

